Patent claims

1. A camshaft (50), comprising a shaft (13) onto which one or more annular cams (30, 30'; 36, 36'; 46, 46') are slid and are fastened by positive and/or non-positive connection, characterized in that the cams (30, 30'; 36, 36'; 46, 46') are produced from one or more profile strips (17, 17'; 34, 34') by forming, in particular bending, into annular form and welding together of the free ends.

2. The camshaft as claimed in claim 1, characterized in that the shaft (13) is of tubular configuration.

3. The camshaft as claimed in one of claims 1 or 2, characterized in that the shaft (13), in the sections in which the cams (30, 30'; 36, 36'; 46, 46') are placed, has an enlarged external diameter.

4. The camshaft as claimed in claim 3, characterized in that, in the sections having the enlarged external diameter, circumferential beads (14, 15) are incorporated in the shaft.

5. The camshaft as claimed in one of claims 3 or 4, characterized in that the cams (30', 46') have on the inner side of the ring means (12, 32) for creating a positive connection to the shaft (13).

6. The camshaft as claimed in claim 5, characterized in that the means for creating a positive connection comprise projections (12) or ribs (32) which protrude radially inward.

7. The camshaft as claimed in one of claims 1 to 6, characterized in that the free ends of the cams (30,

30'; 36, 36'; 46, 46') are welded together by means of resistance welding.

8. The camshaft as claimed in claim 7, characterized in that the cams have a recess (41) in the region of the weld seam (29) on the inner side of the ring, which recess receives the bead (31) formed during the welding.

9. The camshaft as claimed in one of claims 1 to 8, characterized in that the cams (36, 36') are produced in such a way from a profile strip (34, 34') of thickness which varies over the strip length that the cams (36, 36') enclose the shaft (13) with an angle of enclosure (UW) which is greater than the angle of enclosure which is predefined by the cam profile if the strip thickness is constant, and in particular measures 360°.

10. The camshaft as claimed in claim 9, characterized in that the profile strip (34') has two shoulders (37, 38) disposed symmetrically to a center plane.

11. The camshaft as claimed in claim 9, characterized in that the profile strip (34) has in the middle a thickening (35).

12. The camshaft as claimed in one of claims 1 to 8, characterized in that the cams (46, 46') are produced from a profile strip (17, 17') of constant thickness, and in that, on the inner side of the ring of the cam, the angle of enclosure (UW) is enlarged by a forming process, in particular is brought to 360°.

13. The camshaft as claimed in claim 12, characterized in that the cams (46, 46'), on the inner side of the ring in the region of the elevation (49), have an indentation (45).

14. The camshaft as claimed in one of claims 1 to 13, characterized in that the cams (30, 30'; 36, 36'; 46, 46') are produced from a profile strip (17') which has two layers (17a, 17b) of different material lying one above the other.

15. A method for producing a camshaft as claimed in claim 1, in which method cams (30, 30'; 36, 36'; 46, 46') are produced from one or more profile strips (17, 17'; 34, 34') by bending and subsequent welding together of the free ends and are then fastened on a shaft (13) at a predefined location and in a predefined alignment, characterized in that the cams (30, 30'; 36, 36'; 46, 46') are positively and/or non-positively connected to the shaft (13) by being slid onto the shaft (13).

16. The method as claimed in claim 15, characterized in that the shaft (13) is first enlarged in terms of the external diameter in a section which is earmarked for the seat of a cam, and in that the associated cam is subsequently slid onto this section of the shaft (13).

17. The method as claimed in claim 16, characterized in that, for the enlargement of the external diameter, circumferential beads (14, 15) are created on the shaft (13) by a rolling operation.

18. The method as claimed in one of claims 15 to 17, characterized in that, for the production of the cams (36, 36'), a profile strip (34, 34') of varying thickness is used, such that the cams (36, 36') enclose the shaft (13) with an angle of enclosure (UW) which is greater than the angle of enclosure which is predefined by the cam profile if the strip thickness is constant, and in particular measures 360°.

19. The method as claimed in one of claims 15 to 17, characterized in that, on the inner side of the ring of the cams (30', 46'), means (12, 32) for creating a positive connection to the shaft (13) are produced by a forming process, which means comprise, in particular, projections (12) or ribs (32) which protrude radially inward.

20. The method as claimed in one of claims 15 to 19, characterized in that, when the profile strips (17, 17') are transformed into the cams (46, 46') by an additional forming step, in particular by the impression of an indentation (45), material is transported outward in the axial direction in the region of the elevation (49) of the cam (46, 46') and is heaped up there in such a way that the finished cam (46, 46') encloses the shaft (13) with an angle of enclosure of 360°.

21. The method as claimed in claim 20, characterized in that the additional forming step is performed after the elevation of the cam (46, 46') has been configured by forming methods.

22. The method as claimed in one of claims 15 to 21, characterized in that the profile strips (17, 17'; 34, 34' are created from a round wire by forming methods, in particular by rolling methods.